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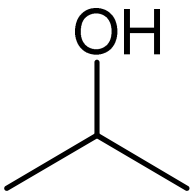
Technical Data & Safety Bulletin



Isopropyl Alcohol (IPA)

PRODUCT OVERVIEW

Isopropyl Alcohol (IPA) is an organic compound with the formula $(CH_3)_2CH(OH)$. This clear, colorless liquid is widely used as a solvent.

IPA is very flammable with a high vapor pressure; use only with good ventilation and avoid all ignition sources. See Product Properties.

IPA exposure is possible in both industrial and consumer applications. Occupational exposure limits have been established to control the allowable amount of exposure in workplace settings. Consumer exposure, generally infrequent and short in duration, is also highly dependent upon the conditions under which IPA is used. See Health Information.

IPA does not cause adverse health or environmental effects at levels typically found in the workplace or in the environment.

OTHER NAMES

CAS 67-63-0	IPA	Isopropanol
2-Propanol	Propan-2-ol	2-Propyl Alcohol
2-Hydroxypropane	1-Methylethanol	

TYPICAL PROPERTIES

Molecular Weight	60.09 g/mol
Empirical Formula	C_3H_8O
Appearance	Colorless Liquid
Boiling Point @ 760mm Hg	82.2°C (180.0°F)
Freezing Point	-88.5°C (-123.7°F)
Flash Point – Closed Cup	12°C (53°F)
Autoignition Temperature	425°C
Specific Gravity @ 20/20°C	0.787
Vapor Pressure @ 20°C	4.1 kPa
Evaporation Rate (n-butyl acetate =1)	1.5
Solubility in Water @ 20°C	Miscible
Surface Tension @ 20°C	23 mN/m
Refractive Index @ 20°C	1.376
Viscosity @ 20°C	2.4 mPa·s
Lower Explosive Limit	2 v/v%
Upper Explosive Limit	12 v/v%
Conductivity @ 20°C	6 µS/m
Dielectric Constant @ 20°C	18.6
Specific Heat @ 20°C	2.6 kJ/kg/°C
Heat of Vaporization @ Tboil	664 kJ/kg
Heat of Combustion (net) @ 25°C	31000
Odor Threshold	22 ppm

Note: The properties reported above are typical physical properties. Haltermann in no way guarantees that the product from any particular lot will conform exactly to the given values.

PRODUCT USES

Isopropanol is used as a solvent and in making many commercial products. The annual production volume of isopropanol has been in excess of one billion pounds since 1956. Rubbing alcohol is a solution of 70% isopropanol in water. Other uses and sources include: a component of antifreeze; a solvent for gums, shellac, essential oils, creosote and resins; extraction of alkaloids; component of quick drying oils and inks; component of denaturing alcohol; antiseptic for hand lotions; component of household products (after-shave lotions, cosmetics, etc.); deicing agent for liquid fuels; dehydrating agent and synthetic flavoring adjuvant.

Human exposure will be both in occupational atmospheres and from use of consumer products containing isopropanol as a volatile solvent.

Isopropyl Alcohol – USP Grade is produced to comply with Chapter <1078> Good Manufacturing Practices for Bulk Pharmaceutical Excipients and the current USP Monograph for Isopropyl Alcohol. Haltermann's Isopropyl Alcohol is therefore intended for use as an Excipient. If used as an active ingredient, it is the responsibility of the producer of the finished dosage form to ensure that all applicable requirements are met.

HEALTH INFORMATION

Isopropanol has a low order of acute toxicity. It is irritating to the eyes, but not to the skin. Very high vapor concentrations are irritating to the eyes, nose, and throat, and prolonged exposure may produce central nervous system depression and narcosis. Human volunteers reported that exposure to 400 ppm isopropanol vapors for 3 to 5 min. caused mild irritation of the eyes, nose and throat.

Although isopropanol produced little irritation when tested on the skin of human volunteers, there have been reports of isolated cases of dermal irritation and/or sensitization. The use of isopropanol as a sponge treatment for the control of fever has resulted in cases of intoxication, probably the result of both dermal absorption and inhalation. There have been a number of cases of poisoning reported due to the intentional ingestion of isopropanol, particularly among alcoholics or suicide victims. These ingestions typically result in a comatose condition. Pulmonary difficulty, nausea, vomiting, and headache accompanied by various degrees of central nervous system depression are typical. In the absence of shock, recovery usually occurred.

The systemic (non-cancer) toxicity of repeated exposure to isopropanol has been evaluated in rats and mice by the inhalation and oral routes. The only adverse effects-in addition to clinical signs identified from these studies were to the kidney.

POTENTIAL FOR EXPOSURE

Based on the uses for IPA, the public could be exposed through:

- **Workplace exposure** – This refers to potential exposure to IPA in a manufacturing facility or through evaporation in various industrial applications. Generally, exposure to IPA of personnel in manufacturing facilities is relatively low because the process, storage and handling operations are enclosed. The US Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) to IPA vapors is 400 parts per million (ppm) per an 8-hour work day.

- **Consumer use of products containing IPA** – This category of exposure is highly variable depending on the products used and the conditions under which they are used. Exposure of the majority of consumers to commercial IPA sources is likely to be infrequent and of short duration. Exposure could occur through the use of Rubbing Alcohol, lacquers and paints; essential oils, cosmetics.

- **Environmental releases** – Isopropanol can enter the environment as emissions from its manufacture and use as a solvent. It naturally occurs as a plant volatile and is released during the microbial degradation of animal wastes.

Chemical manufacturers are committed to operating in an environmentally responsible manner everywhere business is done. Efforts are guided by in-depth scientific understanding of the environmental impact of operations, as well as the social and economic needs of the communities. Industrial spills or releases are rare; however a spill may pose a significant flammability issue.

REGULATORY STATUS

Refer to the JHL Material Safety Data sheet for more specific information.

IPA is not subject to the reporting requirement of CERCLA.

IPA is a SARA Section 313 chemical.

IPA is on the U.S. TSCA list and is included in the EEC's EINECS, Canadian DSL, Australian and Japanese chemical inventories.

STORAGE AND HANDLING

General industry practice is to store IPA in carbon steel vessels.

Avoid contact with air when storing for long periods of time. Anhydrous IPA can form peroxides in the presence of air.

IPA should be stored only in tightly closed, properly vented containers away from heat, sparks, open flame or strong oxidizing agents. Use only non-sparking tools. Containers should be grounded before beginning transfer. Electrical equipment should conform to national electric code.

Handle empty containers carefully. Flammable combustible residue remains after emptying. Storage in properly lined steel or stainless steel to avoid slight discoloration from mild steel is recommended. This product may absorb water if exposed to air.

IPA has a flash point of 53°F. It is an acute and chronic health hazard and flammable liquid as defined under SARA Title III, section 311/312 hazard category.

Provided proper storage and handling precautions are taken, IPA manufactured and delivered by Johann Haltermann Ltd. is stable for at least 12 months. IPA that is subsequently repackaged, handled and/or delivered by third parties may have a different shelf life and may require third party shelf life studies. On-going studies of IPA held in glass at ambient temperature are stable for at least two years.

Undue exposure or spillage should be strictly avoided as a matter of good practice. Refer to the Material Safety Data Sheet for more specific information.

ADDITIONAL INFORMATION

Johann Haltermann Ltd. IPA MSDS
OECD SIDS Assessment for IPA
OSHA Chemical Summary for IPA

Product Code: 40769
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